

REMARKS

A. Background

Claims 12-40 were pending in the application at the time of the Office Action.¹ Claims 12-40 were rejected as being anticipated by and/or obvious over cited art. By this response Applicant has cancelled claims 14, 17, 19, and 24-27; amended claims 12, 16, 20-22, 29, and 35; and added new claims 41 and 42. As such, claims 12, 13, 15, 16, 18, 20-23, and 28-42 are presented for the Examiner's consideration in light of the following remarks.

B. Proposed Amendments

Applicant has herein amended claims 12, 16, 20-22, 27, 29, and 35 to further clarify the invention and to address formal matters. Specifically, independent claim 12 has been amended to include the limitations recited in claim 19, which previously depended from claim 12. Also, independent claims 12, 29, and 35 have been amended to recite that the length of each DBR region is “within a range where the effective length of the ... DBR region increases/decreases linearly in relation to the length of the ... DBR region.” Applicant has also added new claims 41 and 42. The amendments to the claims are supported in the specification at least at paragraphs [0012] and [0042].

In view of the foregoing, Applicant respectfully submits that the amendments to the claims do not introduce new matter and entry thereof is respectfully requested.

¹ The Office Action mistakenly asserts that claims 1-11 are also pending but withdrawn. However, claims 1-11 were cancelled in a preliminary amendment entered into the record on November 2, 2005 and are thus not pending.

C. Anticipation Rejection

Pages 2-4 of the Office Action reject claims 12-15, 17-19, 21, 23, 25, 26, 28-32, 34-38, and 40 under 35 USC § 102(b) as being anticipated by an article titled “Inherently Mode-Hop-Free Distributed Bragg Reflector (DBR) Laser Array” by Fujiwara et al. (“*Fujiwara*”). Inasmuch as claims 14, 17, 19, 25, and 26 have been cancelled herein, the rejection of those claims has been rendered moot. Of the remaining rejected claims, claims 12, 29, and 35 are independent claims. Applicant respectfully submits that the cited art does not include all the claim limitations recited in the rejected claims.

Fujiwara discloses using DBR lasers to demonstrate mode-hop-free tuning characteristics. See p. 1132, left column, last partial paragraph. To do this, *Fujiwara* discloses two types of DBR lasers: a mode-hop-free DBR laser (designated as “Type A”) and a conventional DBR laser (designated as “Type B”). See p. 1133, right column, last paragraph. The Type A laser was configured so that the length of the front DBR (L_{F-DBR}) was 200 μm and the length of the rear DBR (L_{R-DBR}) was 450 μm when the coupling factor of corrugation was controlled to be 90 cm^{-1} . The Type B laser was configured so that L_{F-DBR} was 200 μm and L_{R-DBR} was 350 μm when the coupling factor of corrugation was controlled to be 150 cm^{-1} . See p. 1134, left column, first paragraph.

Referring to Figure 3 of *Fujiwara* and Figure 15 of the current application, when the coupling factor of corrugation is controlled to be 90 cm^{-1} and 150 cm^{-1} as disclosed in *Fujiwara*, the respective saturation values of the effective length of the DBR are 55.5 μm and 33.3 μm . Consequently, 75% of these saturation values are 41.6 μm and 25.0 μm , respectively. Extrapolating from Figure 3 of *Fujiwara*, the actual lengths of the DBR regions would thus need to be approximately 100 μm or less (for a coupling factor of 90 cm^{-1}) and approximately 50 μm or less (for a coupling factor of 150 cm^{-1}) for the actual length of the DBR region to correspond to an effective length of 75% or less of the

saturated effective length of the respective DBR region. However, as noted above, *Fujiwara* only discloses actual DBR region lengths substantially higher than these values.

Furthermore, by only disclosing actual DBR lengths that correspond to the saturated effective length of the DBR region, the effective length of the DBR regions of *Fujiwara* do not increase or decrease linearly in relation to the length of the DBR region.

In view of the foregoing, Applicant submits that *Fujiwara* does not teach or suggest a “DBR region having a diffraction grating in a section whose length corresponds to an effective length of 75% or less of the saturated effective length value” of the DBR region, or that the length of the DBR region is “within a range where the effective length of the ... DBR region increases/decreases linearly in relation to the length of the ... DBR region.” as recited in independent claims 12, 29, and 35. Accordingly, Applicant respectfully requests that the anticipation rejection of claims 12, 29, and 35 be withdrawn.

Claims 13, 15, 18, 21, 23, 28, 30-32, 34, 36-38 each depend from one of claims 12, 29, and 35 and thus incorporate the limitations thereof. As such, Applicant respectfully submits that claims 13, 15, 18, 21, 23, 28, 30-32, 34, 36-38 are distinguished over *Fujiwara* for at least the same reasons as discussed above regarding claims 12, 29, and 35. Accordingly, Applicant respectfully requests that the anticipation rejection of claims 13, 15, 18, 21, 23, 28, 30-32, 34, 36-38 also be withdrawn.

Applicant further submits that it would not be obvious to modify the lengths of the DBR regions of *Fujiwara* to match those required in the rejected claims. For example, *Fujiwara* explicitly discloses that “For efficient expansion of $\Delta\lambda_{\text{con}}$, we select L_{DBR} of more than 200 μm .” Page 1133, left column, last paragraph. This recited minimum length of the DBR regions of *Fujiwara* is clearly higher than the maximum lengths discussed above (approximately 55 μm and 110 μm for the stated coupling factors) that would be required for the DBR regions of *Fujiwara* to even arguably meet the

requirements of the rejected claims. As such, *Fujiwara* teaches away from using actual lengths of the DBR regions that fall within the claimed values.

D. Obviousness Rejections

Pages 4-5 of the Office Action rejects claims 16, 20, and 24 under 35 USC § 103(a) as being obvious over *Fujiwara* in view of U.S. Patent No. 4,905,253 to Chraplyvy et al. ("*Chraplyvy*"). *Chraplyvy* was merely cited for allegedly teaching "an anti-reflection coatings to two end faces." Pages 5-6 of the Office Action rejects claims 22, 27, 33, and 39 under 35 USC § 103(a) as being obvious over *Fujiwara* in view of U.S. Patent No. 4,993,036 to Ikeda et al. ("*Ikeda*"). *Ikeda* was merely cited for allegedly teaching a "diffraction grating with different grating." Inasmuch as claims 24 and 27 have been cancelled herein, the rejection of those claims has been rendered moot. Regarding the remaining rejected claims, Applicant submits that the Office Action has not established that the allegedly obvious combination would include each and every element recited in the rejected claims.

Claims 16, 20, 22, 33, and 39 each depend from one of claims 12, 29, and 35 and thus incorporate the respective limitations thereof. As such, even if, *arguendo*, it would have been obvious to combine *Fujiwara* with the cited art in the allegedly obvious manners set forth in the Office Action, the resulting combinations would still not cure the deficiencies of *Fujiwara* with regard to claims 12, 29, and 35. As such, Applicant submits that claims 16, 20, 22, 33, and 39 are distinguished over the cited art for at least the same reasons as discussed above with regard to claims 12, 29, and 35. Accordingly, Applicant respectfully requests that the obviousness rejections with regard to claims 16, 20, 22, 33, and 39 be withdrawn.

No other objections or rejections were set forth in the Office Action.

E. Conclusion

Applicant notes that this response does not discuss every reason why the claims of the present application are distinguished over the cited art. Most notably, applicant submits that many if not all of the dependent claims are independently distinguishable over the cited art. Applicant has merely submitted those arguments which it considers sufficient to clearly distinguish the claims over the cited art.

In view of the foregoing, applicant respectfully requests the Examiner's reconsideration and allowance of claims 12, 13, 15, 16, 18, 20-23, and 28-42 as amended and presented herein.

In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Dated this 19th day of November 2007.

Respectfully submitted,

/Scott A. Woodbury/ Reg. #55743

SCOTT A. WOODBURY

Registration 55,743

DANA L. TANGREN

Registration No. 37,246

Attorneys for Applicant

Customer No. 022913

Telephone No. 801.533.9800

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